

ANL-6426

Idaho

ANL-6426

Argonne National Laboratory

ELECTRICAL PROPERTIES OF GLASS

A BIBLIOGRAPHY

Prepared by

Robert Kepple

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

- A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or*
- B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.*

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

ANL-6426
Chemistry
(TID-4500, 16th Ed.,
Amended)
AEC Research and
Development Report

ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue
Argonne, Illinois

ELECTRICAL PROPERTIES OF GLASS
A BIBLIOGRAPHY

Prepared by

Robert Kepple

The Library
Technical Information Division

July 1961

Operated by The University of Chicago
under
Contract W-31-109-eng-38

TABLE OF CONTENTS

	<u>Page</u>
BOOKS	4
DIELECTRIC PROPERTIES - GENERAL	4
Dielectric Breakdown	8
Dielectric Constant.	9
Dielectric Losses.	10
Dielectric Relaxation	14
Effect of Composition	15
Effect of Frequency	16
Effect of Temperature.	17
Insulators	18
ELECTRICAL CONDUCTIVITY.	20
Effect of Composition	23
Effect of Field Strength.	27
Effect of Temperature.	27
Measurement.	28
Surface.	29
ELECTRICAL RESISTIVITY.	30
Determination	31
AUTHOR INDEX.	33

ELECTRICAL PROPERTIES OF GLASS
A BIBLIOGRAPHY

Prepared by

Robert Kepple

The Library
Technical Information Division
Argonne National Laboratory

July, 1961

The following list of 267 references was obtained from:

Applied Science and Technology Index	1940 - 1960
Ceramics Abstracts	1940 - 1960
Chemical Abstracts	1940 - 1960
Engineering Index	1940 - 1960
U.S. Department of Commerce. OTS Catalog of Technical Reports	1930 - 1958

The arrangement is by broad subject and an author index has been provided.

Individuals interested in the literature prior to 1940 are referred to

Duncan, George S.,
Bibliography of Glass (from the earliest records to 1940),
Society of Glass Technology, Sheffield (1960).

BOOKS

1. Day, Ralph K., Glass Research Methods. Chicago, Industrial Publications, 1953.
Chapter 6 - The electrical properties and behavior of glass.
2. Littleton, J. T., The Electrical Properties of Glass, by J. T. Littleton and G. W. Morey. New York, Wiley, 1933.
3. Morey, G. W., The Properties of Glass. 2d ed. New York, Reinhold, 1954. (American Chemical Society, Monograph Series No. 124.)
4. Stanworth, J. E., Physical Properties of Glass. New York, Oxford University Press, 1950.
5. The Structure of Glass. Symposium, Leningrad, Nov. 23-27, 1953. Ed. by A. A. Lebedev, N. A. Toropov, V. P. Barzakovskii, and A. A. Appen. Published by the Acad. Sci. U.S.S.R., Leningrad-Moscow, 1955.
Electric conductance of simple borate systems in the glassy state. B. I. Markin, p. 264-6.
Electric conductance of glasses in strong electric fields. The wetting of metals by glass. V. A. Presnov, p. 267-9.
Electric conductance of silica glass. V. P. Pryanishnikov, p. 270-2.

DIELECTRIC PROPERTIES - GENERAL

6. ACTION OF CLIMATE ON ELECTRICAL MATERIALS, by R. Leprétre. La Nature, 1949, No. 3170: 163-67.
7. AIR-GAP TEST CELL FOR MEASURING PROPERTIES OF SHEET DIELECTRICS, by S. I. Reynolds and D. A. Kollath (General Electric). Rev. Sci. Instr. 29, 295-6 (1958).
8. ANELASTICITY OF GLASS; CORRELATION OF ELECTRICAL STRAIN IN GLASS, by J. V. Fitzgerald. Bibliog. Am. Cer. Soc. J. 34: 390-1 (Dec. 1, 1952).
9. ANOMALOUS DISPERSION OF THE DIELECTRIC PERMEABILITY IN FIELDSPARS, by V. A. Ioffe, and G. I. Khvostenko. Doklady Akad. Nauk, S.S.R. 118: 709-12 (1958).

10. CONDENSER WITH DIELECTRIC LAYERS OF GLASS, Jenaer Glaswerk Schott and Gen. Swiss 227, 689, Nov. 17, 1943 (Nov. 10, 1942). Abstracted in Chem. Zentr., 1944, II (15/16) 782.
11. CONTRIBUTION A L'ETUDE DES PROPRIETES DIELECTRIQUES DU VERRE, by A. Danzin and P. Meunier. Academie des Sciences - Comptes Rendus 228 (5) 391-3 (Jan. 31, 1949).
Study of dielectric properties of glass; theoretical and experimental study; diagrams.
12. DIELECTRIC AND STRUCTURAL STUDIES IN THE SYSTEMS Ba(Ti, Nb)O₃ AND Ba(Ti, Ta)O₃, by E. C. Subbarao and G. Shirane. Biblio. Am. Cer. Soc. J. 42: 279-84 (June 1, 1959).
13. DIELECTRIC CONSTANT AND LOSS ANGLE OF GLASS, by Francis Naudin. Compt. Rend. 232 (9) 831-32 (1951).
14. DIELECTRIC HYSTERESIS, by M. S. Kosman. J. Exptl. Theoret. Phys. U.S.S.R. 17, 507-8 (1947) (Russian).
15. DIELECTRIC IGNITERS FOR MERCURY POOL CATHODE TUBES; USE MADE OF ABILITY OF GLASS TO WITHSTAND INCREASED POTENTIAL GRADIENTS AS THICKNESS IS DECREASED, by H. Klemperer. Biblio. il. diag. Electronics 14: 38-41 (Nov., 1941).
16. DIELECTRIC INSULATING MATERIALS OF LOW LOSS FACTOR, by F. A. Bickford and R. K. Smith (Corning Glass Works) U.S. 2,887,394, May 19, 1959.
17. DIELECTRIC MATERIALS, by P. Robinson and D. B. Peck (Sprague Electric Co.) U.S. 2,704,105, March 15, 1955.
18. DIELECTRIC PROPERTIES OF GLASS, by A. Danzin and P. Meunier. Compt. Rend. 228, 391-3 (1949).
19. DIELECTRICS, PROGRESS IN. Vol. II. London, Heywood, 1960. p. 113-164. The dielectric properties of glass. Paul M. Sutton.
20. THE DIELECTRIC PROPERTIES OF GLASS AND THEIR STRUCTURAL INTERPRETATION, by W. A. Weyl (State College, Pa.). J. Soc. Glass Technol. 33 T 220-38 (1949).
21. DIELECTRIC PROPERTIES OF GLASSES. Cer. Ind. 46: 55 (May, 1946).

22. DIELECTRIC STRENGTH OF GLASS; AN ENGINEERING VIEWPOINT,
by E. B. Shand. Bibliog. Elec. Eng. 60: Trans. 814-18 (Ag '41).
23. DIELECTRIC SUBSTANCES FOR HIGH FREQUENCY CONDENSERS,
by Siemens & Halske Akt-Ges. (Friedrich Bischoff, inventor) Ger.
956,433, Jan. 17, 1957..
24. ELASTIC AFTEREFFECTS AND DIELECTRIC ABSORPTION IN GLASS,
by N. W. Taylor. Bibliog. diags. J. Ap. Phys. 12: 753-8 (Oct.,
1941).
25. ELECTRIC STRENGTH OF FIBROUS GLASS, by A. Gemmant and F. A.
Glascow. Elec. Eng. 58 (8): 341-45 (1939).
26. ELECTRICAL GLASS, by E. M. Guyer. Bibliog. Inst. Radio Eng. Proc.
32: 743-50 (Dec., 1944).
27. ELECTRICAL PROPERTIES AND CONSTANTS OF GLASS, by J.
Voldan (Vyzkumny Ustav Sklarsky, Hradec Kralove, Czech) Sklar
a Keramik 6, 15-17, 34-8 (1956).
28. ELECTRICAL PROPERTIES OF GLASS, by M. Kantzer. Verre, 2,
21-34 (1947).
29. ELECTRICAL PROPERTIES OF GLASS FIBER PAPER, by T. D.
Callinan, R. L. Lucas and R. C. Bowers. Elec. Mfg. 48 (2)
94-97, 248-50 (1951).
30. THE ELECTRICAL PROPERTIES OF ORGANIC GLASSES. (Vieweg)
1939. 21 p. PB96184.
31. ELECTRICAL PROPERTIES OF TRANSPARENT PLASTIC MATE-
RIALS (ORGANIC GLASS) (Vieweg) 1946. 22p. PB47708.
32. ELECTRICALLY CONDUCTIVE CERAMIC COMPOSITION, by
W. Vose (Taylor, Tunnicliff & Co., Ltd.) Can. 458, 118, July 12,
1949 (Feb. 3, 1944).
33. ELECTRON PERMEABLE GLASS FOIL. (Ackermann) 1944. 2p.
(German) PB12421.
34. ETUDE DE QUELQUES PROPRIETES DUE VERRE DUES A SA
NATURE ELECTROLYTIQUE, by P. Le Clerc. Chimie & Industrie
V. 69, No. 4 (April, 1953) p. 653-7.
Properties of glass attributable to its electrolytic nature.

35. GLASS FOR ELECTRONIC COMPONENTS. Corning Glass Works, New York, 1956. 244 f. PB132833.
36. GLASS HAVING LOW POWER FACTOR, W. H. Armistead, Jr. (Corning Glass Works). U.S. 2,431,980, Dec. 2, 1947, (Oct. 11, 1944).
37. GLASS HAVING LOW POWER FACTOR, W. H. Armistead (Corning Glass Works) U.S. 2,449,099, Sept. 14, 1948 (Jan. 23, 1945).
38. GLASS HAVING LOW POWER FACTOR, W. H. Armistead (Corning Glass Works) Can. 447,959, April 20, 1948 (Aug. 3, 1945).
39. GLASS HAVING LOW POWER FACTOR, H. P. Hood (Corning Glass Works) U.S. 2,410,286, Oct. 29, 1946 (Nov. 12, 1943).
40. GLASS THESES AT ALFRED, S. R. Scholes. Glass Ind., 25 (9): 399-401, 424 (1944).
41. LOW POWER FACTOR GLASS, W. H. Armistead (Corning Glass Works). Can. 442,279, June 17, 1947 (Aug. 3, 1945); (in U.S. Jan. 23, 1945). H. P. Hood (Corning Glass Works). Can. 442,280, June 17, 1947 (Oct. 25, 1945).
42. MEASUREMENTS AND EVALUATION OF ELECTRICAL POTENTIALS BETWEEN OXIDE SYSTEMS (INCLUDES GLASS - ELECTRICAL PROPERTIES). Pennsylvania State College, School of Mineral Industries, Pa. 1954. 65 p. PB111795.
43. A PRECISION RESONANCE METHOD FOR MEASURING DIELECTRIC PROPERTIES OF LOW-LOSS SOLID MATERIALS IN THE MICROWAVE REGION, by S. Saito and K. Kurokawa (Univ. of Tokyo) Proc. Inst. Radio Engrs. 44: 35-42 (1956).
44. PREPARATION OF A GROUP OF GLASSES WITH INCREASED DI-ELECTRIC PERMEABILITY AND INVESTIGATION OF THEIR DI-ELECTRIC PROPERTIES, by G. I. Skanavi and A. M. Kashtanova (L. N. Lebedev Inst. Phys. Acad. Sci. U.S.S.R. Moscow) Zhur. Tekh. Fiz. 27: 1770-7 (1957) Soviet Phys. Tech. Phys. 2: 1645-51 (English translation).
45. RECENT DEVELOPMENTS IN CERAMIC DIELECTRICS, by E. J. Smoke and J. H. Koenig. Ceram. Age 60 (6) 20-21 (1952).

46. SERVICES, FACILITIES, AND MATERIAL FOR RESEARCH AND DEVELOPMENT LEADING TOWARD IMPROVED OR NEW DESIGNS OF GLASS DIELECTRIC CAPACITORS. Corning Glass Works, New York (Smith) 1949. 16 p. PB107988.
 47. SOURCES OF ERROR IN HIGH-FREQUENCY MEASUREMENTS OF THE DIELECTRIC PROPERTIES OF GLASS, by Rosemary Hudson. Phys. Rev. 54: 866-7.
 48. STRUCTURAL LOSSES IN AMORPHOUS DIELECTRICS, by V. K. Kozlovskii (Inst. Semiconductors, Acad. Sci. U.S.S.R., Leningrad) Izvest. Akad. Nauk. S.S.R., Ser. Fiz. 22, 279-82 (1958).
 49. THE STRUCTURE OF GLASS. THE CRYSTALLINE THEORY OF GLASS STRUCTURE, by K. S. Evstrop'ev. Structure of Glass, Proc. Conf. Leningrad. 1953 (Pub. 1958) (English translation).
 50. TABLES OF DIELECTRIC MATERIALS, Massachusetts Institute of Technology Lab. for Insulation Research, 1944. PB 4658.
Tables of dielectric materials Vol. II (von Hippel) 1945. PB 4661.
Tables of dielectric materials Vol. III (includes glass-dielectric properties) MIT Lab. for Insulation Research. 1948. PB 98537.
 51. TABLES OF DIELECTRIC MATERIALS, Vol. IV, Jan. 1953. Mass. Inst. Tech. NP-4665; Tech. Rept. 57.
 52. UEBER DIE ELEKTRISCHE LEITFAEHIGKEIT UND DURCHSCHLAG-FESTIGKEIT DUENNER GLASFOLIEN, by G. Glaser. Zeit fuer Angewandte Physik, Vol. 4, No. 1, Jan. 1952. P. 12-16.
Electric conductivity and dielectric strength of thin glass laminates; dielectric strength of glass is shown to be independent of thickness and electric conductivity down to 0.07 microns; dielectric breakdown is shown to decrease with decreasing temperature.
 53. VITREOUS CAPACITOR DIELECTRIC ELEMENTS SUCH AS THOSE OF CONDENSERS, by M. Hirose and H. Kamogawa (to Gen'l. Elec.) U.S. 2,220,765, Nov. 5, 1941.
- Dielectric Breakdown
54. BREAKDOWN AND ELECTRIC CONDUCTIVITY OF GLASS, by K. H. Keller (N. V. Kema, Arnhem, Netherlands) Physica 17, 511-30 (1951) (in English).

55. BREAKDOWN IN VACUUM UNDER THE INFLUENCE OF SOLID DIELECTRICS, by P. H. Gleichauf and G. C. Thomas. Nov. 25, 1947. Westinghouse Res. Labs. (R-94432-4-A).
56. ELECTRIC BREAKDOWN OF GLASSES AND CRYSTALS AS A FUNCTION OF TEMPERATURE, by A. von Hippel and R. J. Maurer. Bibliog. diags. Phys. Rev. 59: 820-3 (May 15, 1941).
- THE ELECTRICAL BREAKDOWN OF GLASSES AT ELEVATED TEMPERATURES. See No. 131.
57. ELECTRON AVALANCHE AND DIELECTRIC BREAKDOWN IN SOLIDS. II, by C. Yamanaka and T. Suita (Osaka Univ.). J. Phys. Soc. Japan 7, 225-6 (1952).
58. FORMATION AND ANNULMENT OF SPACE CHARGES IN GLASS AND THEIR INFLUENCE ON ELECTRIC BREAKDOWN, by K. J. Keller. Phys. Rev. 86: 804-5 (June 1, 1952).
59. MECHANISM OF ELECTRIC BREAKDOWN IN GLASS, by K. Inada. Oyo Butsuri (Applied Phys.) 12, 223-5 (1943).
60. THE RELATION BETWEEN IONIC CONDUCTIVITY AND BREAKDOWN STRENGTH OF GLASS, by J. Vermeer (Speurwerk Afdeling N. V. Kema, Arnhem, Netherlands.) Physica 22: 1269-78 (1956) (in English).
61. THE THEORY OF DIELECTRIC BREAKDOWN IN SOLIDS, by H. Fröhlich (Bristol Univ., Eng.) Proc. Roy. Soc. (London) A188, 521-32 (1947).

Dielectric Constant

- DEPENDENCE OF THE DIELECTRIC CONSTANT AND THE LOSS ANGLE OF SILICATE GLASSES ON THEIR COMPOSITION. See No. 70.
62. DEVELOPMENT OF LOW DIELECTRIC CONSTANT GLASSES. Glass Fibers, Inc., Waterville, O. (Dunn) 1950. 13p. PB104554.
63. DIELECTRIC CONSTANT AND DISSIPATION FACTOR OF SODA-POTASSIA-SILICA GLASSES AT FREQUENCIES OF ONE TO 300 KILOCYCLES AT ROOM TEMPERATURE, by G. F. Stockdale. Diags. illus. U. Eng. Exp. Sta. Bull. 411: 1-27 (1953). Excerpts. Glass Ind. 35: 381 (July 1954).
64. EFFECT OF COMPOSITION AND THERMAL HISTORY ON DIELECTRIC CONSTANTS OF SODA-BOROSILICATE GLASSES, by J. M. Humphrys and W. R. Morgan. J. Am. Ceram. Soc. 24: 123-30 (1941).

65. MEASUREMENTS OF POWER FACTOR AND DIELECTRIC CONSTANT AT ULTRAHIGH FREQUENCIES, by K. G. Coutlee, R. F. Field, E. O. Hausmann, T. Hazen, and H. R. Meahl. Proc. Am. Soc. Testing Materials, Preprint No. 81, 57-67 (1941).
66. METHOD OF DETERMINING THE DIELECTRIC CONSTANT AND POWER FACTOR OF CERAMICS AT 100 MEGACYCLES AS A FUNCTION OF TEMPERATURE, by H. J. Evans. J. Am. Ceram. Soc., 32 (8) 262-66 (1949).
67. A METHOD OF MEASURING DIELECTRIC CONSTANTS AND LOSS IN THE RANGE OF 10-CM WAVES, by L. Turi. Magyar Tudomanyos Akad. Kozponti. Fiz. Kutato Intezetenek Kozlemenye: 3, 70-80 (1955).
68. MICROWAVE TECHNIQUES FOR THE MEASUREMENT OF THE DIELECTRIC CONSTANT OF FIBERS AND FILMS OF HIGH POLYMERS, by T. M. Shaw and J. J. Windle. Bibliog. diags. J. Ap. Phys. 21: 956-61 (Oct. 1950).
69. REPORT ON ROUND-ROBIN TESTS OF POWER FACTOR AND DIELECTRIC CONSTANT FOR GLASS, by P. A. Richards. Diags. Am. Soc. T. M. Proc. 41: 1183-97 (1941).

Dielectric Losses

70. DEPENDENCE OF THE DIELECTRIC CONSTANT AND THE LOSS ANGLE OF SILICATE GLASSES ON THEIR COMPOSITION, by A. A. Appen and R. I. Bresker. Zhur. Tekh. Fiz. 22, 946-54 (1952); Science Abstr. 56A, 116 (1953).
71. DEVICE FOR THE HEATING BY DIELECTRIC LOSSES OF TUBES MADE OF GLASS OR OTHER VITREOUS MATERIAL, by M. Descarsin. Brit. 649, 757, Dec. 20, 1950 (Jan. 30, 1945).
72. DIELECTRIC LOSS AND THE STATES OF GLASS, by D. W. Rinehart (Pittsburgh Plate Glass Co.). J. Am. Ceram. Soc. 41: 470-5 (1958).
73. THE DIELECTRIC LOSS OF DIFFERENT GLASSES AT SHORT WAVE LENGTHS AS A FUNCTION OF TEMPERATURE, by M. J. O. Strutt and D. van der Ziel. Physica 10: 445-50 (1943).
74. DIELECTRIC LOSS OF GLASS, by J. M. Stevels. Glastech. Ber. 26 (8): 227-31 (1953).

75. DIELECTRIC LOSS OF GLASS AT HIGH FREQUENCIES, by H. Thurnauer and A. E. Badger. J. Am. Ceram. Soc. 23, 9-12 (1940).
76. DIELECTRIC LOSS OF GLASSES OF THE $\text{Na}_2\text{O}\text{-BaO}\text{-SiO}_2$ SYSTEM, by N. Yashuhara. J. Japan. Ceram. Assoc. 51: 100-101 (1943); Ceram. Abstracts 1950, 23 (In. J. Am. Ceram. Soc. 33, No. 2).
77. DIELECTRIC LOSSES IN BORATE GLASSES AT HIGH FREQUENCIES, by A. F. Val'ter, M. A. Gladkikh and K. I. Martyushov. J. Tech. Phys. (U.S.S.R.) 10: 1593-1603 (1940).
78. DIELECTRIC LOSSES IN BORIC GLASSES AT HIGH FREQUENCIES, by R. M. Kessenikh. Zhur. Tekh. Fiz., 11, 1149-53 (1941); Chem. Abs., 36, 2769 (1942).
79. DIELECTRIC LOSSES IN GLASS, by J. M. Stevels (Philips Research Lab., Eindhoven, Netherlands). Glastech. Ber. 26, 227-31 (1953).
80. DIELECTRIC LOSSES IN GLASS, by J. M. Stevels. Philips Tech. Rev. 13 (12) 360-370 (June, 1952).
81. DIELECTRIC LOSSES IN GLASSES. II. INVESTIGATION OF ELECTRICAL AND PHYSICAL PROPERTIES OF SODIUM ALUMINOSILICATE GLASSES, by N. M. Verebeichik and V. I. Odelevskii. Soviet Phys. Tech. Phys. 1, 1647-53 (1957) (English translation). III. RELAXATION, HIGH-TEMPERATURE DIELECTRIC LOSSES IN ALKALINE GLASSES. Ibid. 1654-62.
82. DIELECTRIC LOSSES IN GLASSES. II. INVESTIGATION OF ELECTRICAL AND PHYSICAL PROPERTIES OF SODIUM ALUMINOSILICATE GLASSES, by N. M. Verebeichik and V. I. Odelevskii. Zhur. Tekh. Fiz. 26, 1696-703 (1956). III. RELAXATION, HIGH-TEMPERATURE DIELECTRIC LOSSES IN ALKALINE GLASSES. Ibid. 1704-13.
83. DIELECTRIC LOSSES IN GLASSES OF THE SYSTEM $\text{NaO}\text{-PbO}\text{-SiO}$ AT HIGH FREQUENCIES, by A. A. Khar'kov. Akad. Nauk S.S.S.R., Otdel Khim Nauk, Akad. Nauk S.S.S.R., I. Gosudarst, Ordena Lenina Opticheskii Inst., Sbornik Statei 1949. 158-63.
84. DIELECTRIC LOSSES IN SILICATE GLASSES, by V. A. Ioffe. Zhur. Tekh. Fiz. 24, 611-21 (1954).
85. DIELECTRIC LOSSES IN SOLID MATERIALS RESULTING FROM LATTICE DEFECTS, by J. M. Stevels and J. Volger (N. V. Philips Gloeilampenfabrieken, Eindhoven, Netherlands). Chem. Weekblad 52, 469-75 (1956).

86. DIELECTRIC LOSSES OF DIFFERENT GLASSES IN THE SHORT-WAVE RANGE AS DEPENDENT ON TEMPERATURE, by M. J. O. Strutt and A. van der Zeil. Physica, 10 (6) 445-50 (1943); abstracted in Chem. Zentr., 1944, I (19/20) 1066.
87. DIELECTRIC LOSSES OF SOME GLASSES AND RELATED MATERIALS, MEASURED AT LOW TEMPERATURES, by J. Volger (Philips Gloeilampenfabrieken, Eindhoven, Netherlands). Compt. Rend. 27e congr. intern. chim. ind., Brussels, 1954 3; Industrie Chim. belge 20, Spec. No., 128-32 (1955).
88. DIELECTRIC LOSSES OF SOME SIMPLE TERNARY SILICATE GLASSES; abstract. D. W. Rinehart, Cer. Ind. 69: 87 (Dec. 1957).
89. DIELECTRIC LOSSES OF SOME SIMPLE TERNARY SILICATE GLASSES, by D. W. Rinehart and J. J. Bonino. Bibliog. Am. Cer. Soc. J. 42: 107-12 (March 1, 1959).
90. DIELECTRIC POLARIZATION AND LOSSES OCCURRING IN ALUMINAPHOSPHATIC GLASSES, by V. P. Petrosan. Izvest. Akad. Nauk Armyan S.S.R., Ser. Khim. Nauk 10, No. 4, 247-55 (1957).
91. ELECTRICAL PROPERTIES OF GLASS: III, EFFECTS OF TEMPERATURE ON THE HIGH-FREQUENCY CONDUCTANCE AND DIELECTRIC LOSS IN GLASS, by Taro Moriya. J. Japan. Ceram. Assoc., 54 (623) 41-43 (1946).
92. EXPERIMENTAL INVESTIGATION OF DIELECTRIC LOSSES OF SOME GLASSES AT LOW TEMPERATURES, by J. Volger and J. M. Stevels. Verres et refractaires 11, 137-46 (1957).
93. EXPERIMENTS AND THEORIES ON THE POWER FACTOR OF GLASSES AS A FUNCTION OF THEIR COMPOSITION. II. J. M. Stevels (N. V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands). Verres refract. 5, 4-14 (1951); Philips Research Repts. 6, 34-53 (1951).
- FUNDAMENTAL STUDIES ON GLASS: X. EFFECTS OF FREQUENCY ON THE CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS, by Taro Moriya. See No. 124.
- FUNDAMENTAL STUDIES ON GLASS: XI. EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DIELECTRIC LOSS, by Taro Moriya. See No. 132.
94. FURTHER EXPERIMENTAL INVESTIGATION OF DIELECTRIC LOSSES OF VARIOUS GLASSES AT LOW TEMPERATURES, by J. Volger, J. M. Stevels. Philips Research Reports Vol. 11, No. 6 (Dec. 1956) p. 452-70.

95. GLASS OR VITREOUS COMPOSITION HAVING VERY LOW ELECTRICAL LOSS; Patent. Glass Ind. 28: 82 (Feb. 1947).
- GLASSES OF HIGH RESISTIVITY AND LOW DIELECTRIC LOSSES,
by Andre Danzin. See No. 256.
- A METHOD OF MEASURING DIELECTRIC CONSTANTS AND LOSS
IN THE RANGE OF 10-CM WAVES, by L. Turi, et. al. See No. 67.
96. NATURE OF THE DIELECTRIC LOSS IN SODA-ALUMINUM SILICATE
GLASSES, by V. A. Ioffe. Soviet Phys. - Tech. Phys. 2, 1344-50
(1957) (English translation); Zhur. Tekh. Fiz. 27 1454-61.
97. THE NATURE OF DIELECTRIC LOSSES IN INORGANIC GLASSES, by
V. P. Petrosyan. Izvest. Akad. Nauk Armyan S.S.R. Khim. Nauki
12, 81-90 (1959) (in Russian).
98. NEUTRALIZING EFFECT IN SILICATE GLASS, by G. I. Skanavi and
A. I. Demeshina (P. N. Lebedev Inst. Phys., Moscow) Soviet Phys. -
Tech. Phys. 3, 697-702 (1958) (English translation).
99. PROPERTIES OF GLASS. X. EFFECTS OF FREQUENCY ON THE
CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS, by Taro Moriya.
J. Japan. Ceram. Assoc. 54, 63-5 (1946). XI. EFFECT OF HEAT-
TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DI-
ELECTRIC LOSS: Ibid. 55 39-42 (1947).
100. THE RELATION BETWEEN THE DIELECTRIC LOSSES AND THE
COMPOSITION OF GLASS, by J. M. Stevels (N. V. Philips'
Gloeilampenfabrieken, Eindhoven, Netherlands). J. Soc. Glass
Technol. 34, 80T-100T (1950).
101. THE RELATIONSHIP BETWEEN DIELECTRIC LOSS AND THE STRUC-
TURE OF GLASS, by J. M. Stevels (Philips' Gloeilampenfabrieken,
Eindhoven, Netherlands). Silicates Ind. 16, 325-8 (1951); 17,
15-18 (1952).
102. SOME EXPERIMENTS AND THEORIES ON THE POWER FACTOR OF
GLASSES AS A FUNCTION OF THEIR COMPOSITION, by J. M. Stevels.
Philips Research Rept. 5, 23-36 (1950).
103. SOME EXPERIMENTS AND THEORIES ON POWER FACTOR OF
GLASSES AS FUNCTION OF THEIR COMPOSITION, III, J. M. Stevels.
Philips Research Reports 7 (3) June, 1952. P. 161-8.

104. STRUCTURE OF GLASS - REPORT OF A SYMPOSIUM ON THE
 STRUCTURE OF GLASS, Leningrad, Nov. 23-27, 1953. Ed. by A. A.
 Lebedev, N. A. Totopov, V. P. Barzakovskii, and A. A. Appen.
 Akademiya Nauk S.S.R., Leningrad-Moscow, 1955.

V. A. Ioffe: "Dielectric losses in silicate glasses."
 (pp. 258-63).

105. TEMPERATURE CHARACTERISTICS OF DIELECTRIC LOSSES AT
 HIGH FREQUENCIES, by T. Akahira, M. Kamazawa, and Y. Tumita.
Bull. Inst. Phys. Chem. Research (Tokyo) 18, 517-28 (1939).

Dielectric Relaxation

106. DIELECTRIC RELAXATION EXHIBITED BY GLASS. I. THEORY
 AND METHODS OF MEASUREMENT, by H. E. Taylor (Parkinson &
 Spencer Ltd., Halifax, Can.). J. Soc. Glass Technol. 41, 350-82
 (1957).
107. DIELECTRIC RELAXATION EXHIBITED BY GLASS. II. SODA-
 SILICA AND SODA-LIME-SILICA GLASSES, by H. E. Taylor
 (Parkinson & Spencer Ltd., Halifax, Can.). J. Soc. Glass
Technol. 43 124T-146T (1959).
108. DIELECTRIC RELAXATION OF GLASS AND PSUEDO-CAPACITY
 OF METAL-TO-GLASS INTERFACES, MEASURED AT EXTREMELY
 LOW FREQUENCIES, by J. Volger, J. M. Stevels, and C. van Amerongen.
Philips Research Repts. 8 (6) 452-70 Dec., 1953.
109. DIELECTRIC RELAXATION SPECTRE OF LITHIUM BOROSILICATE
 GLASSES, by L. Heroux (Corning Glass Works) J. Appl. Phys. 29,
 1639-45 (1958).
110. DIELECTRIC RELAXATION SPECTRUM OF GLASS, by H. E. Taylor
 (Univ., Sheffield, England). Trans. Faraday Soc. 52, 873-81
 (1956).
111. INVESTIGATION OF DIELECTRIC RELAXATION EXHIBITED BY
 GLASS - 1, by H. E. Taylor. Soc. Glass Technology J. 41 (203)
 350-82 (Dec., 1957).
112. INVESTIGATION OF DIELECTRIC RELAXATION EXHIBITED BY
 GLASS - 2, by H. E. Taylor. Soc. Glass. Tech. J. 43 (211) 124-46
 (April, 1959).
- RELAXATION, HIGH-TEMPERATURE DIELECTRIC LOSSES IN
 ALKALINE GLASSES, by N. M. Verebeichik and V. I. Odelevskii.
 See No. 81, 82.

Effect of Composition

- DEPENDENCE OF THE DIELECTRIC CONSTANT AND THE LOSS ANGLE OF SILICATE GLASSES ON THEIR COMPOSITION, by A. A. Appen, et al. See No. 70.
113. DETERMINATION OF SEVERAL ENERGY VALUES FOR BASIC IONS IN A STRUCTURAL MODEL OF GLASS. I. V. P. Petrosyan. Izvest. Akad. Nauk Armyan S. S. R., Khim. Nauki 11 No. 6, 377-84 (1958) (in Russian).
- DIELECTRIC AND STRUCTURAL STUDIES IN THE SYSTEMS Ba(Ti,Nb)O₃ AND Ba(Ti,Ta)O₃, by E. C. Subbarao, et al. See No. 12.
114. DIELECTRIC PROPERTIES OF TELLURITE GLASSES, by J. P. Poley (Nat'l. Defense Research Council, The Hague, Netherlands). Nature 174, 268 (1954).
115. DIELECTRIC STUDIES OF SOME BORATE AND PHOSPHATE GLASSES, by C. Hirayama and M. M. Rutter (Westinghouse Elec. Corp., Pittsburgh, Pa.) J. Am. Ceram. Soc. 42: 367-73 (1959).
116. EFFECT OF BARIUM TITANATE ON THE DIELECTRIC PROPERTIES OF METAPHOSPHATE AND METABORATE LEAD GLASSES, by I. N. Belyaev, A. L. Khodakov and M. L. Sholokhovich (Rostov State University) Zhur. Fiz. Khim. 27: 1157-62 (1953).
- EFFECT OF COMPOSITION AND THERMAL HISTORY ON DIELECTRIC CONSTANTS OF SODA-BOROSILICATE GLASSES, by J. M. Humphrys and W. R. Morgan. See No. 64.
117. EFFECT OF CONCENTRATION OF BIVALENT METAL OXIDES ON THE ELECTRIC PROPERTIES OF PHOSPHATE GLASSES, by V. P. Petrosyan. Izvest. Akad. Nauk Armyan S.S.R. Khim. Nauki 11, 213-18 (1958) (in Russian).
118. THE ELECTRIC STRENGTHS OF GLASSES WITH DIFFERENT SODIUM CONTENTS, by J. Vermeer (Speurwerk Afdeling N. V. Kema, Arnhem, Netherlands). Physica 22: 1247-53 (1956) (in English).
119. THE ELECTRICAL PROPERTIES OF ALKALI-LIME-SILICA GLASSES, SOME CONTAINING BORIC OXIDE OR ALUMINA, IN RELATION TO GLASS STRUCTURE, by H. Moore and R. C. De Silva. J. Soc. Glass Technol. 36, 5-55T (1952).
120. ELECTRICAL PROPERTIES OF SOME LITHIA-CONTAINING GLASSES, by A. E. Dale, E. F. Pegg, and J. E. Stanworth (Brit. Thomson-Houston Co., Ltd., Rugby, Engl.) J. Soc. Glass Technol. 35 T136-45 (1951).

121. ELECTRICAL PROPERTIES OF VITREOUS SILICA, by A. E. Owen and R. W. Douglas (Univ. Sheffield, Engl.) J. Soc. Glass Technol. 43, 159T-178T (1959).
- EXPERIMENTS AND THEORIES ON THE POWER FACTOR OF GLASSES AS A FUNCTION OF THEIR COMPOSITION, by J. M. Stevels. See No. 93.
- THE RELATION BETWEEN THE DIELECTRIC LOSSES AND THE COMPOSITION OF GLASS, by J. M. Stevels. See No. 100.
- SOME EXPERIMENTS AND THEORIES ON THE POWER FACTOR OF GLASSES AS A FUNCTION OF THEIR COMPOSITION, by J. M. Stevels. See Nos. 102, 103.
122. STUDY OF ELECTRICAL PROPERTIES OF ALKALI-LIME SILICIA GLASSES, SOME CONTAINING BORIC OXIDE OR ALUMINA, IN RELATION TO GLASS STRUCTURE, by H. Moore and R. C. De Silva. J. Soc. Glass Technol. Vol. 36, No. 168 Feb., 1952 p. 5-51 (discussion) 51-5.
- Effect of Frequency
- DIELECTRIC LOSS OF GLASS AT HIGH FREQUENCIES, by H. Thurnauer and A. E. Badger. See No. 75.
- DIELECTRIC LOSSES IN BORATE GLASSES AT HIGH FREQUENCIES, by A. F. Val'ter, et al. See No. 77.
- DIELECTRIC LOSSES IN BORIC GLASSES AT HIGH FREQUENCIES, by R. M. Kessenikh. See No. 78.
- DIELECTRIC LOSSES IN GLASSES OF THE SYSTEM $\text{Na}_2\text{O} - \text{PbO} - \text{SiO}_2$ AT HIGH FREQUENCIES, by A. A. Khar'kov. See No. 83.
- ELECTRICAL PROPERTIES OF GLASS: III, EFFECTS OF TEMPERATURE ON THE HIGH-FREQUENCY CONDUCTANCE AND DIELECTRIC LOSS IN GLASS, by Taro Moriya. See No. 91.
123. DIELECTRIC PROPERTIES OF GLASSES AT ULTRA-HIGH FREQUENCIES AND THEIR RELATION TO COMPOSITION, by L. Navias and R. L. Green (General Elec. Co.) J. Am. Ceram. Soc. 29, 267-76 (1946).
124. FUNDAMENTAL STUDIES ON GLASS: X, EFFECTS OF FREQUENCY ON THE CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS, by Taro Moriya. J. Japan. Ceram. Assoc., 54 (624) 63-65 (1946).

MEASUREMENTS OF POWER FACTOR AND DIELECTRIC CONSTANT AT ULTRAHIGH FREQUENCIES, by K. G. Coutlee, et al. See No. 65.

125. THE MELTING OF GLASS IN AN ELECTRIC FIELD OF HIGH FREQUENCY, by V. V. Vargine, E. V. Podushko. *Steklo i Keram* 15, No. 6, 16-19 (1958).

PROPERTIES OF GLASS: X, EFFECTS OF FREQUENCY ON THE CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS. XI, EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DIELECTRIC LOSS, by Taro Moriya. See No. 99.

126. SOURCES OF ERROR IN HIGH-FREQUENCY MEASUREMENTS OF THE DIELECTRIC PROPERTIES OF GLASS, by R. Hudson. Presented at meeting of Amer. Phys. Soc., South Hadley, Mass., Oct., 1938. Abstracted in Phys. Rev. 54 (9) 866-67 (1938).

127. SPECTRA OF HIGH AND LOW FREQUENCY - APPLICATIONS TO GLASS, by P. Girard and P. Abadie. Bull. Inst. Verre, No. 2, pp. 15-21 (1946).

TEMPERATURE CHARACTERISTICS OF DIELECTRIC LOSSES AT HIGH FREQUENCIES, by T. Akahira, et al. See No. 105.

Effect of Temperature

THE DIELECTRIC LOSS OF DIFFERENT GLASSES AT SHORT WAVE LENGTHS AS A FUNCTION OF TEMPERATURE, by M. J. O. Strutt and A. van der Ziel. See No. 73.

DIELECTRIC LOSSES OF DIFFERENT GLASSES IN THE SHORT-WAVE RANGE AS DEPENDENT ON TEMPERATURE, by M. J. O. Strutt and A. van der Ziel. See No. 86.

DIELECTRIC LOSSES OF SOME GLASSES AND RELATED MATERIALS, MEASURED AT LOW TEMPERATURES, by J. Volger. See No. 87.

EFFECT OF COMPOSITION AND THERMAL HISTORY ON DIELECTRIC CONSTANTS OF SODA-BOROSILICATE GLASSES, by J. M. Humphrys and W. R. Morgan. See No. 64.

128. THE EFFECT OF THERMAL TREATMENT ON THE DIELECTRIC PROPERTIES OF CERAMIC BODIES. (Tech. Rept. No. 1) E. M. Tuttle and H. H. Wilson, North Carolina State College. June 15, 1950 (NP-1653).

ELECTRIC BREAKDOWN OF GLASSES AND CRYSTALS AS A FUNCTION OF TEMPERATURE, by A. von Hippel and R. J. Maurer. See No. 56.

ELECTRICAL PROPERTIES OF GLASS: III, EFFECTS OF TEMPERATURE ON THE HIGH-FREQUENCY CONDUCTANCE AND ELECTRIC LOSS IN GLASS, by Taro Moriya. See No. 91.

129. ELECTRIC PROPERTIES OF GLASS AT VARIOUS TEMPERATURES, by M. A. Dolov, U. Z. Kabardin. Gosudarst Pedagog. Inst. 1956, No. 10, 13-28.
130. THE ELECTRICAL BEHAVIOR OF GLASS AT ROOM TEMPERATURE, by E. M. Guyer. J. Am. Ceram. Soc. 16 607-18 (1933).
131. THE ELECTRICAL BREAKDOWN OF GLASSES AT ELEVATED TEMPERATURES, by M. Pirani. J. Soc. Glass Tech. 27, 38-41 (1943).
EXPERIMENTAL INVESTIGATION OF DIELECTRIC LOSSES OF SOME GLASSES AT LOW TEMPERATURE, by J. Volger. See No. 92.
132. FUNDAMENTAL STUDIES ON GLASS: XI, EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DIELECTRIC LOSS, by T. Moriya. J. Japan Ceram. Assoc. 55 (626) 39-42 (1947).
FURTHER EXPERIMENTAL INVESTIGATION OF DIELECTRIC LOSSES OF VARIOUS GLASSES AT LOW TEMPERATURES, by J. Volger. See No. 94.
133. HIGH-TEMPERATURE MEASUREMENTS ON DIELECTRIC SUBSTANCES IN THE REGION OF CENTIMETER WAVES, by F. Borgnis. Helv. Phys. Acta 22, 149-54 (1949).
RELAXATION, HIGH-TEMPERATURE DIELECTRIC LOSSES IN ALKALINE GLASSES, by N. M. Verebeichik and V. I. Odelevskii. See Nos. 81, 82.
TEMPERATURE CHARACTERISTICS OF DIELECTRIC LOSSES AT HIGH FREQUENCIES, by T. Akahira, et al. See No. 105.

Insulators

134. BEHAVIOURS OF PORCELAIN AND GLASS INSULATORS UNDER TEST CONDITIONS; Abstracts. A. E. Helden, et al. Elec. R. (Lond) 126: 426-7 April 12, 1940; Electrician 124: 321 April 26, 1940; Engineering 149: 434, April 26, 1940.
135. CERAMIC INSULATING MATERIALS, by H. Thurnauer. Elec. Eng. 59: 456-8 (Nov. 1940).
136. CORNING INSULATING GLASS. Patent Glass Ind. 29: 570 October 1948.

137. DEVELOPMENT OF A PRE-STRESSED GLASS INSULATOR, by P. M. Hogg. Diags. Engineering 149: 449 April 26, 1940; Abstract Elec. R. (Lond.) 126: 426 April 12, 1940.
138. DEVELOPMENT OF A PRE-STRESSED (TOUGHENED) GLASS INSULATOR, by P. M. Hogg. Diags. Inst. E. E. J. 87: 615-24; Discussions 656-64 Dec., 1940.
- DIELECTRIC INSULATING MATERIALS OF LOW LOSS FACTOR, by Fred A. Bickford. See No. 16.
139. ELECTRICAL CONDUCTION IN THE GLASS INSULATION OF RESISTANCE THERMOMETERS, by H. J. Hoge. Bibliog. diags. J. Res. Nat. Bur. Stand. 28: 489-98 April 1942.
140. ELECTRICAL INSULATION RESEARCH REVIEWED, by A. V. Astin, et al. Elec. Eng. 60 22-6 (1941).
141. ELECTRICAL RESISTANCE UNDER VARYING CONDITIONS OF SOME GLASSES AND PORCELAWS OF POSSIBLE UTILITY FOR COMMERCIAL INSULATORS, by E. Seddon, J. W. Mitchell, and W. E. S. Turner. J. Soc. Glass Tech., 23 (98) 197-238T (1939).
142. GLASS AS AN ELECTRICAL INSULATOR, by C. J. Phillips. Bibliog. J. Ap. Phys. 11: 173-81 March, 1940.
143. MULTIFORM GLASS FOR INSULATION DEVELOPED BY CORNING. II. Glass Ind. 24: 168 April, 1943; Sci. Am. 168: 255 June, 1943.
144. PERFORMANCE OF GLASS INSULATORS, AND COMPARISONS WITH PORCELAIN, by A. E. Helden, et al. II. diags. Inst. E. E. J. 87: 625-56 Discussion 656-64 (Dec., 1940).
145. PROPERTIES OF PAPER AND GLASS INSULATION; TABULATION: ENGINEERING REFERENCE SHEET. Elec. World 134: 100 Aug. 28, 1950.
146. SIGNIFICANCE OF GLASS INSULATION, by G. L. Moses. II. Power Pl. Eng. 44: 50-2. March, 1940.
147. SPECIAL GLASS FOR HIGH-TEMPERATURE ELECTRIC INSULATION. Societe generale de constructions electriques et mechaniques (Alsthom) Fr. 861, 370, Feb. 7, 1941.
148. TOUGHENED GLASS INSULATORS. II. Elec. R. (Lond.) 141: 461-6; Sept. 16, 1947.

149. TOUGHENED GLASS INSULATORS, by C. K. Downie. Il. Elec. R.
(Lond.) 159: 106-8; July 20, 1956.

ELECTRICAL CONDUCTIVITY

150. APPLICATION OF ROT-E-PROCESS THEORY TO GLASS; ELECTRICAL CONDUCTIVITY, by D. A. Stuart and O. L. Anderson. Biblio. diag. Am. Cer. Soc. J. 36: 27-30; Jan. 1, 1953.
- BREAKDOWN AND ELECTRIC CONDUCTIVITY OF GLASS, by K. J. Keller. See No. 54.
151. CHANGE OF THE ELECTRICAL CONDUCTIVITY OF (SODA-LIME) GLASS DURING ITS STABILIZATION, by M. Munakata and M. Iwamoto. Yogyo Kyokai Shi, 65 (744) 331-35 (1957).
152. LA CONDUCTIBILITE ELECTRIQUE DES VERRES, by M. Bonan. Vide 1 (6) 170-3 Nov., 1946.
153. CONDUCTING GLASS, by H. Anders. Glas-Email-Keramo-Tech. 10 (12) 469-70 (1959).
154. CONDUCTING GLASS (NESA) ELIMINATES FOGGING. Anon. Chem. Industries 59 (3) 506, 508 (1946).
155. CRYSTAL CHEMISTRY OF DEFECTIVE STRUCTURES (INCLUDES ELECTRIC CONDUCTIVITY OF GLASSES; SILVER IONS - DIFFUSION INTO GLASS), Pennsylvania State College, School of Mineral Industries, Pa. 1951. 131f. PB116217.
156. THE DIRECT-CURRENT CONDUCTIVITY OF GLASSES, by J. M. Stevels (N. V. Philips' Gloeilampenfabrieken, Eindhoven, Neth.). Silicates Inds. 22, 325-35 (1957).
157. EFFECT OF SMALL QUANTITIES OF FOREIGN OXIDES ON THE ELECTRICAL CONDUCTIVITY OF GLASS, by I. G. Mel'nikov, A. Y. Kuznetsov, and V. A. Brinberg. J. Phys. Chem. (U.S.S.R.), 24 (11) 1294-98 (1950); abstracted in Chem. Zentr., 122 II (7) 935 (1951).
158. ELECTRIC CONDUCTIVITY OF GLASS, by W. Tuszynski. Szklo i Ceram. 7, 165-8 (1956).
159. ELECTRIC CONDUCTIVITY OF GLASSES, by M. Vonan. Le Vide 1, 170-3 (1946).

160. ELECTRICAL CONDUCTION IN GLASS, by P. L. Kirby. Brit. J. App. Phys. 1 (8) 193-202 (Aug., 1950).
161. ELECTRICAL CONDUCTIVITY AND POTENTIAL DISTRIBUTION IN GLASS, by I. Tsurumi (Kobe Ind. Corp.) Oyo Butsuri 22, 114-18 (1953).
162. ELECTRICAL CONDUCTIVITY IN COMPOSITE ALKALINE BORIC GLASSES: $\text{Li}_2\text{O}-\text{K}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Li}_2\text{O}-\text{Na}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Na}_2\text{O}-\text{BaO}-\text{B}_2\text{O}_3$, by B. I. Markin. Zhur. Tekh. Fiz. 10: 66-78 (1940). Chem. Abs. 34, 7555 (1960).
163. ELECTRICAL CONDUCTIVITY OF BORATE GLASSES CONTAINING DISPERSED GOLD, by S. K. Majumdar, G. Bandyopakyay, and S. Datta. Nature, 167 (4239) 157-58 (1951).
164. ELECTRICAL CONDUCTIVITY OF GLASSES OF THE SYSTEM $\text{K}_2\text{O}-\text{SiO}_2$, by A. Y. Kuznetsov, and I. G. Mel'nikova. J. Phys. Chem. (U.S.S.R.) 24, 1204-1209 (1950). Abstracted in Chem. Zentr., 122 (22) 3000 (1951).
165. THE ELECTRICAL CONDUCTIVITY OF IONIC-ATOMIC VALENCE SOLIDS; V. ELECTRICAL CONDUCTIVITY OF BOROSILICATES IN THE STABLE STATE, by R. L. Myuller. Zhur. Tekh. Fiz. 25 1868-77 (1955).
166. ELECTRICAL CONDUCTIVITY OF SILVER BORATE GLASSES, by B. I. Markin. Zhur. Obschchei Khim. 11, 285-92 (1941); abstracted in Physik. Ber. 23 (14): 1147 (1942).
167. ELECTRICAL CONDUCTOR FOR DISCHARGE DEVICES, by W. T. Anderson, Jr. (Havovia Chem. & Manufacturing Co.) U.S. 2,659,183 Nov. 17, 1953.
168. ELECTRICALLY CONDUCTING GLASS AND METHOD FOR PRODUCING, by R. A. Gaiser (Libbey-Owens-Ford Glass Co.) U.S. 2,919,212 Dec. 29, 1959.
169. ELECTRICALLY CONDUCTING GLASSES, by R. L. Green and K. B. Blodgett. Bibliog. Am. Cer. Soc. J. 31: 89-100 April 1, 1948; Excerpt. Glass Ind. 29: 395 July, 1948.
170. ELECTRICALLY CONDUCTING LAMINATED GLASS, by R. A. Gaiser (to Libbey-Owens-Ford Glass Co.) U.S. 2,697,675. Dec. 21, 1954.
171. ELECTRICALLY CONDUCTIVE GLASS IS USEFUL FOR HEATING APPLICATIONS. II. Materials and Methods 30: 70-1, Aug., 1949.

172. ELECTROCONDUCTIVE GLASS, by M. Hatoyma (to Bureau of Industrial Technics) Japan 8189 (54) Dec. 11.
173. ELECTROCONDUCTIVITY OF GLASS; abstract. R. L. Myuller. Am. Cer. Soc. Bull. 22 (Cer. A. 22): 6 Jan. 15, 1943.
174. THE ELECTROLYTIC CONDUCTIVITY OF GLASS, by G. Hofbauer. Z. Physik. Chem. Unterricht 55, 50-1 (1942) Chem. Zentr. 1942 II, 978.
- FUNDAMENTAL STUDIES ON GLASS: X, EFFECTS OF FREQUENCY ON THE CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS, by T. Moriya. See No. 124.
- FUNDAMENTAL STUDIES ON GLASS: XI, EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DIELECTRIC LOSS, by T. Moriya. See No. 132.
175. GLASS OF HIGH ELECTRICAL CONDUCTIVITY; Patent. Glass Ind. 32: 611-12 (Dec., 1951).
176. INVESTIGATIONS ON THE ELECTRICAL CONDUCTANCE OF SILVER-LITHIUM BORATE GLASSES, by B. I. Markin. J. Phys. Chem. (U.S.S.R.), 23, 142 (1949); Brit. Ceram. Abstracts, 49 (9) 396a (1950).
177. LIGHT TRANSMISSIVE ELECTRICALLY CONDUCTING ARTICLE, by W. J. Colbert, A. R. Weinrich, and W. L. Morgan (Libbey-Owens-Ford Glass Co.) U.S. 2,628,927 Feb. 17, 1953.
178. MAGNITUDE OF THE SURFACE CONDUCTIVITY AT AQUEOUS-GLASS INTERFACES, by H. L. White, F. Urban and B. Monaghan. Bibliog. diag. J. Phys. Chem. 45: 560-73 (April, 1941).
179. MAKING ELECTRICALLY CONDUCTING GLASS AND ARTICLES MADE THEREFROM, by R. B. Ellis (Corning Glass Works) U.S. 2,556,616, June 12, 1951 (March 25, 1948).
180. THE NATURE OF THE ELECTRIC CONDUCTIVITY IN GLASS, by R. L. Myuller. Zhur. Eksptl. i Teoret. Fiz., 27 264 (1954).
181. PREPARATION AND SOME PROPERTIES OF CONDUCTING TRANSPARENT GLASS, by R. Gomer. R. Sci. Instr. 24: 993 (Oct., 1953).

PROPERTIES OF GLASS: X. EFFECTS OF FREQUENCY ON THE CONDUCTIVITY AND DIELECTRIC LOSS OF GLASS; XI. EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY AND DIELECTRIC LOSS, by Taro Moriya. See No. 99.

THE RELATION BETWEEN IONIC CONDUCTIVITY AND BREAKDOWN STRENGTH OF GLASS, by J. Vermeer. See No. 60.

182. RELATION OF ELECTRICAL CONDUCTIVITY TO CHEMICAL COMPOSITION OF GLASS, by A. E. Badger and J. F. White. Jour. Amer. Ceram. Soc. 23 (9): 271-74 (1940).
183. STUDY OF THE AMORPHOUS STATE. XVIII. ELECTRIC CONDUCTIVITY OF SUBSTANCES IN THE AMORPHOUS AND CRYSTALLINE STATES, by P. P. Kobeko, E. V. Kuvshinskii, and N. I. Shishkin. J. Exptl. Theoret. Phys. (U.S.S.R.) 10, 1071-9 (1940).
184. TRANSFERENCE NUMBERS FOR ELECTRICAL CONDUCTION IN GLASS, by J. V. Fitzgerald (Pittsburgh Plate Glass Co., Creighton, Pa.) J. Chem. Phys. 20, 922 (1952).
185. TRANSPARENT ELECTROCONDUCTIVE GLASS, by Albert E. Jung (Pittsburgh Plate Glass Co.) U.S. 2,695,247, Nov. 23, 1954; Chem. Abstract, 49 (4) 2695a (1955).
- UEBER DIE ELEKTRISCHE LEITFAEHIGKEIT UND DURCHSCHLAGFESTIGKEIT DUENNER GLASFOLIEN, by G. Glaser. See No. 52.
186. USE OF ELECTRICALLY CONDUCTING GLASS FOR COUNTING LESIONS, by S. G. Wildman and I. Rappaport. Il. Science 119: 849-50 June 11, 1954.
187. USE OF ELECTRICALLY CONDUCTING GLASS IN CLOUD-CHAMBER CONSTRUCTION, by C. Bowness and N. Cusak. J. Sci. Instr. 31: 345 Sept., 1954.

Effect of Composition

188. CALCULATION OF ACTIVATION ENERGY OF IONIC CONDUCTIVITY IN SILICA GLASSES BY CLASSICAL METHODS, by O. L. Anderson and D. A. Stuart (Bell Telephone Labs., Inc., Murray Hill, N. J.) J. Am. Ceram. Soc. 37, 573-80 (1954).
189. THE CONDUCTION OF ELECTRICITY IN SIMPLE MIXED ALKALI GLASSES, by B. V. Lengyel. Glastech. Ber. 18, 177-82 (1940).
190. CONDUCTIVITY OF FUSED GLASSES, by K. A. Kostanyan and S. O. Nalchadzhyan. Izvest. Akad. Nauk Armyan. S.S.R., Khim. Nauki 11, No. 5, 317-19 (1958). (in Russian).
191. CONDUCTIVITY OF SODIUM-CALCIUM-MAGNESIUM ALUMINO-SILICATE GLASSES FROM 100 TO 1200°C, by K. A. Kostanyan. Izvest. Akad. Nauk Armyan. S.S.R., Ser. Khim. Nauk 10, 161-72 (1957) (in Russian).

192. CONTROLLING CONDUCTIVITY IN SILICATES. II. Glass Ind. 38: 147 (Mar. 1957).
- EFFECT OF SMALL QUANTITIES OF FOREIGN OXIDES ON THE ELECTRICAL CONDUCTIVITY OF GLASS, by I. G. Mel'nikov, et al. See No. 157.
193. EFFECTS OF FLUORINE ADDED TO GLASS BATCHES ON THE ELECTRICAL CONDUCTANCE, by O. V. Mazurin and E. V. Molchanova. Trudy Leningrad. Tekhnol. Inst. im Lensoveta, 1955. No. 34, 48-52.
194. ELECTRICAL CONDUCTION IN THE ALUMINOSILICATE GLASSES, by J. O. Isard. (Univ. Sheffield, Engl.) J. Soc. Glass Technol. 43, 113T-123T (1959).
195. ELECTRIC CONDUCTIVITY AND TRANSFERENCE NUMBERS OF MIXED GLASSES, by Bela Lengyel. Math. Naturw. Anz. ungar. Akad. Wiss. 59, 501-14 (1940).
196. ELECTRICAL CONDUCTIVITY IN COMPOSITE ALKALINE BORIC GLASSES: $\text{Li}_2\text{O}-\text{K}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Li}_2\text{O}-\text{Na}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Na}_2\text{O}-\text{BaO}-\text{B}_2\text{O}_3$, by B. I. Markin. J. Tech. Phys. (U.S.S.R.) 10, 66-78 (1940).
ELECTRICAL CONDUCTIVITY IN COMPOSITE ALKALINE BORIC GLASSES: $\text{Li}_2\text{O}-\text{K}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Li}_2\text{O}-\text{Na}_2\text{O}-\text{B}_2\text{O}_3$; $\text{Na}_2\text{O}-\text{BaO}-\text{B}_2\text{O}_3$, B. I. Markin, et al. See No. 162.
197. ELECTRICAL CONDUCTIVITY OF ALKALINE BOROSILICATE GLASSES, by B. I. Markin. Zhur. Tekh. Fiz. 22, 932-40 (1952) Science Abstr. 56A, 219-20 (1953).
ELECTRICAL CONDUCTIVITY OF BORATE GLASSES CONTAINING DISPERSED GOLD, by S. K. Majumdar, et al. See No. 163.
198. ELECTRICAL CONDUCTIVITY OF BOROSILVER GLASSES; abstract. B. I. Markin. Chem. & Met. Eng. 48: 132 Dec. 1941.
199. ELECTRICAL CONDUCTIVITY OF CRYSTALLIZED SILICATE GLASSES, by V. V. Vargin and E. A. Antonova. J. Appl. Chem. U.S.S.R. 29, 1881-5 (1956) (English translation).
200. ELECTRIC CONDUCTIVITY OF GLASS. I. CONDUCTIVITY OF MIXED GLASSES, by Bela Lengyel and Zoltan Boksay (Eotvos Lorand Univ., Budapest) Z. Physik. Chem. (Leipzig) 203, 93-112. (1954).

201. ELECTRIC CONDUCTIVITY OF GLASSES. II. CONDUCTIVITY OF LITHIUM-SODIUM, SODIUM-POTASSIUM, AND POTASSIUM-LITHIUM MIXED GLASSES, by Bela Lengyel and Zoltan Boksay (Eotvos Lorand Univ., Budapest). Z. Physik. Chem. (Leipzig) 204, 157-64 (1955).
202. ELECTRIC CONDUCTIVITY OF GLASS. III. CONDUCTIVITY OF ALKALI BORATE MIXED GLASSES, by Bela Lengyel, Maria Somogi, Zoltan Boksay (Eotvos Lorand Univ., Budapest, Hung.) Z. Physik. Chem. (Leipzig) 209, 15-21 (1958).
- ELECTRICAL CONDUCTIVITY OF GLASSES OF THE SYSTEM K_2C-SiO_2 , by A. Y. Kuznetsov, et al. See No. 164.
203. THE ELECTRICAL CONDUCTIVITY OF PLASTIC DIELECTRICS, by A. Gemant. Phil. Mag. 31, 405-12 (1941).
- ELECTRICAL CONDUCTIVITY OF SILVER BORATE GLASSES, by B. I. Markin. See No. 166.
204. ELECTRICAL CONDUCTIVITY OF SOLIDS WITH IONIC-ATOMIC VALENCIES. I. ELECTRICAL CONDUCTIVITY OF BOROSILICATES IN A METASTABLE CONDITION, by R. L. Myuller. Zhur. Tekh. Fiz. 25, 2428-39 (1955).
205. THE ELECTRICAL CONDUCTIVITY OF SOLIDS WITH IONIC-ATOMIC VALENCIES. II. THE EXPERIMENTAL-THEORETICAL EXPRESSIONS FOR MOLAR ELECTROCONDUCTIVITY OF BOROSILICATES, by R. L. Myuller. Zhur. Tekh. Fiz. 25, 246-55 (1955).
- INVESTIGATIONS ON THE ELECTRICAL CONDUCTANCE OF SILVER-LITHIUM BORATE GLASSES, by B. I. Markin. See No. 176.
206. THE NATURE OF THE ELECTRIC CONDUCTIVITY OF SOME ALKALI-FREE GLASSES, by G. A. Pavlova (Lensovet Technol. Inst., Leningrad) Izvest. Vysshaykh Ucheb. Zavedenii, Khim. i Khim. Teknol., 1958, 5, 82-6.
- RELATION OF ELECTRICAL CONDUCTIVITY TO CHEMICAL COMPOSITION OF GLASS, by A. E. Badger and J. F. White. See No. 182.
207. RELATION OF ELECTRICAL CONDUCTIVITY TO CHEMICAL COMPOSITION OF GLASS; SODA-LIME-SILICA SYSTEM MEASURED AT 400°C., by A. E. Badger and J. F. White. Diags. Am. Cer. Soc. J. 23: 271-4 (Sept., 1940).

208. THE RELATIVE EFFECTS OF M_2O AND Al_2O_3 ON THE ELECTRICAL CONDUCTIVITY OF GLASSES AS A FUNCTION OF THEIR COMPOSITION, by L. A. Grechanik. Zhur. Priklad. Khim. 31, 1164-70 (1958).
209. SEMICONDUCTING PROPERTIES OF SOME VANADATE GLASSES, by P. L. Baynton, et al. Bibliog. Electrochem. Soc. J. 104: 237-40 April, 1957.
210. SILICATE GLASSES SHOWING ELECTRON CONDUCTIVITY, by O. V. Mazurin, G. A. Pavlova, E. Y. Lev, and E. K. Leko (Technol. Inst., Leningrad). Soviet Phys. - Tech. Phys. 2, 2511-12 (1957) (English translation). Zhur. Tekh. Fiz. 27, 2702-3.
211. SILIKATNYE STEKLA SELEKTRONNOI PROVODIMOST'YU, by O. V. Mazurin, G. A. Pavlova, E. Y. Lev, E. K. Leko. Zhurnal Tekh. Fiz. 27 (12) Dec., 1957. p. 2702-3.
Silicate glasses with electric conductivity.
212. VISCOSITY AND ELECTRIC CONDUCTIVITY OF Na_2O - B_2O_3 - SiO_2 GLASSES, I, by J. Yamamoto (Toshiba Elec. Works, Kawasaki) J. Ceram. Assoc. Japan 60, 379-82 (1952).
213. VISCOSITY AND ELECTRIC CONDUCTIVITY OF Na_2O - B_2O_3 - SiO_2 GLASS, III, by J. Yamamoto (Tokyo Shibaura Elec. Works, Kawasaki) J. Ceram. Assoc. Japan 61, 211-14 (1953).
214. VLIYANIE OKISI KAL'TSIYA NA ELEKTROPROVODNOST STEKOL SODERZHASHCHIKH DVA SHCHELOCHNYKH OKISLA, by O. V. Mazurin, E. V. Golikova, N. V. Shtol'tser. Fizika Tverdogo Tela 1 (4): 630-1 (April, 1959).
Influence of CaO on electric conductivity of glasses containing one or two alkaline oxides; measurements of changes in neutralization effect in sodium-potassium or lithium-potassium glasses containing 27 mol. % Na_2O - K_2O , in which SiO_2 is replaced by CaO ; results have bearing on development of methods for calculation of electric conductivity of glasses simultaneously containing several alkaline oxides.
215. ZAVISIMOST STEPENI VLIYANIYA OKISLOV Me_2O i Al_2O_3 NA ELEKTROPROVODNOST STEKOL OT IKH SOSTAVA, by L. A. Grechanki. Zhurnal Prikladnoi Khimii 31 (8) 1164-70 (Aug., 1958).
Relative effects of M_2O and Al_2O_3 on electric conductivity of glasses as function of their composition; effect of different proportions of different oxides on electric conductivity of glass.

Effect of Field Strength

216. THE CONDUCTIVITY OF GLASS AS A FUNCTION OF FIELD STRENGTH, by R. J. Maurer, Phys. Rev. 59, 671.
217. DEPENDENCE OF THE ELECTRIC CONDUCTIVITY OF GLASS ON THE ELECTRIC FIELD INTENSITY, by V. A. Presnov and V. I. Gaman (Siberian Phys.-Tech. Inst. Tomsk). Soviet Phys.-Tech. Phys. 2, 857-60 (1957) (English translation).
218. THE ELECTRICAL CONDUCTION OF GLASS AT HIGH FIELD STRENGTHS, by J. Vermeer (Speurwerk Afdeling N. V. Kema, Arnhem, Neth.) Physica 22, 1257-68 (1957).
219. ELECTRONIC CONDUCTIVITIES OF SOLIDS IN STRONG ELECTRIC FIELDS, by I. Chiyo Yamanaka and Tokuo Suita (Osaka Univ.) J. Phys. Soc. Japan 8 274-7 (1953).
220. STRUCTURE OF GLASS - REPORT OF A SYMPOSIUM ON THE STRUCTURE OF GLASS, LENINGRAD, November 23-27, 1953. Ed. by A. A. Lebedev, N. A. Toropov, V. P. Barzakovskii, and A. A. Appen. Akademiya Nauk S.S.S.R., Leningrad-Moscow, 1955.
 V. A. Presnov: I. Electric conductance of glasses in strong electric fields; II. The wetting of metals by glass. pp. 267-69.

Effect of Temperature

221. EFFECT OF HEAT-TREATMENT ON THE ELECTRICAL CONDUCTIVITY OF GLASSES, by S. P. Zhdanov and A. Y. Kuznetsov. Doklady Akad. Nauk S.S.S.R., 85 (3) 587-89 (1952).
222. THE EFFECT OF THERMAL TREATMENT ON THE ELECTRICAL CONDUCTIVITY OF GLASS, by S. P. Zhdanov and A. Y. Kuznetsov. Doklady Akad. Nauk S.S.S.R. 85, 587-9 (1952).
223. ELECTRICAL CONDUCTIVITY IN MOLTEN ALKALI SILICATES, by S. Urnes. Bibliog. diagrs. Glass Ind. 40: 237-9 May, 1959.
224. TEMPERATURE DEPENDENCE OF THE ELECTRICAL CONDUCTIVITY OF JENA OPTICAL GLASSES, by H. Beyersdorfer. Silikattech., 5 (11) 459-62 (1954).
225. TEMPERATURE FUNCTION OF THE ELECTRICAL CONDUCTANCE OF JENA OPTICAL GLASSES, by H. Beyersdorfer (Jenaer Opt. Glaswerke, vorm. Schott & Genossen, Jena, Ger.) Silikattech., 5, 459-62 (1954).

226. THE TEMPERATURE FUNCTION OF THE ELECTRICAL CONDUCTANCE OF SOME GLASSES, by O. V. Mazurin. Trudy Lenigrad.
Tekhnol. Inst. im Lensoveta, 1954, No. 29, 72-89.
227. UEBER THERMOELEKTRISCHE ERSCHEINUNGEN AN GLAESERN,
by W. Oldekop. Glastechnische Berichte 29 (3) 73-8 (March,
1956).
- Thermoelectric phenomena in glass; investigation relating
to current theory on mechanism of conduction in silicate glass.

Measurement

228. CALCULATION OF ELECTRIC CONDUCTIVITY OF MOLTEN GLASS, by N. A. Sheludyakov. Trudy VNIIS (Volzhskii Kompleksnyi Nauch. Issledovatel. Inst. Sooruzhenii, Stroitel. Material. i Sanit. Tekh.) 1953, No. 33, 70-81; Referat. Zhur. Khim. 1954, No. 41910.
229. DETERMINATION OF THE ELECTRIC CONDUCTIVITY OF GLASS BETWEEN 800 AND 1400°, by F. Halla, A. Maschka, J. Proisl, L. Koller and M. Pöll (Tech. Hochschule, Vienna) Monatsh. 81, 1092-7 (1950).
230. ELECTRICAL CONDUCTIVITY MEASUREMENTS USING DIRECT CURRENTS, by P. L. Kirby (J. A. Jobling & Co., Ltd., Sunderland, Engl.) J. Soc. Glass Technol. 37, 3T-6T (1953).
231. MEASUREMENT OF ELECTRIC CONDUCTIVITY OF GLASS IN THE SOLID STATE, by V. I. Shelyubskii. Steklo i Keram. 10, No. 9, 13-15 (1953).
232. MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY OF A GLASS, F. L. Cornish. Glass Ind. 25, 399-401 (1944).
233. MEASUREMENT OF ELECTRICAL CONDUCTIVITY OF GLASS IN THE SOLID STATE, by V. I. Shelyubskii. Steklo i Keram., 10 (9) 13-15 (1953).
234. METHODS FOR MEASURING VOLUME ELECTRICAL CONDUCTIVITY OF SILICATE GLASSES AT ROOM TEMPERATURES, by L. Y. Kurtts. Bull. Acad. Sci. U.S.S.R. Classe Sci. Chim. (1940, 811-24) (in English, 824).

Surface

235. CHANGES OF THE ELECTRIC SURFACE CONDUCTANCE OF GLASS AS A FUNCTION OF TIME IN A CONTROLLED MOIST ATMOSPHERE, by P. Le Clerc. Silicates Ind. 19, 237-42 (1954).
236. ELECTRIC CHARGE ON MACROSCOPIC GLASS SURFACE, by M. Bender. J. Colloid Sci., 9 (5) 400-408 (1954).
237. ELECTRIC SURFACE CONDUCTANCE OF GLASSES IN HUMID ATMOSPHERE, by A. Y. Kuznetsov. Zhur. Fiz. Khim., 27, 657-61 (1953).
238. PLASMA AUGMENTATION OF THE SURFACE CONDUCTIVITY OF GLASSES, by R. G. Fowler and M. Sakuntala. J. Chem. Phys. 27: 824-5 Sept., 1957.
239. SURFACE CONDUCTANCE OF GLASSES IN A HUMID ATMOSPHERE; abstract. A. Y. Kuznetsov. Glass Ind. 35: 79-80 Feb., 1954.
240. SURFACE CONDUCTANCE OF SOLID DIELECTRICS, by N. Chirkov (Inst. Chem. Phys., Acad. Sci. U.S.S.R. Moscow) J. Phys. Chem. (U.S.S.R.) 21: 1303-16 (1947) (in Russian).
241. SURFACE CONDUCTIVITY AT THE PYREX: SOLUTION INTERFACE, Stanford Research Institute. (McBain, Huff, and Brady) 1949. 26p. Order from L. C. Mi \$2.00 Ph \$3.75 PB 105016.
242. SURFACE CONDUCTIVITY GLASS; abstract. Metal Prog. 63: 206 June, 1953.
243. SURFACE CONDUCTIVITY OF INDUSTRIAL GLASSES, by M. Kantzer. Bull. Inst. Verre 1946, No. 5, 11-14.
244. SURFACE CONDUCTIVITY OF LEAD SILICATE GLASS AFTER HYDROGEN TREATMENT, by K. B. Blodgett. Am. Cer. Soc. J. 34: 14-27 Jan. 1, 1951.
245. TEMPERATURE COEFFICIENT OF RESISTANCE OF TIN OXIDE-COATED ELECTRICALLY CONDUCTING GLASS BETWEEN 1° AND 300°K, by D. N. Lyon and T. H. Begalle. R. Sci. Instr. 21: 769-70 August, 1950.

246. UEBER DIE OBERFLAECHENLEITFAEHIGKEIT VON GLAESERN
NACH BEHANDLUNG IN ERHITZTEM WASSERSTAFF, by H. H. Funk.
Glastechnische Berichte 31 (7) July, 1958. p. 269-72.

Surface transport capacity of glass after treatment with hot hydrogen; trials to produce conducting layers on borate glasses, using methods of R. L. Green and K. B. Blodgett; low ohmic layers show differences in temperature coefficient and voltage dependence in comparison with high ohmic layers.

ELECTRICAL RESISTIVITY

247. DEVIATIONS FROM OHM'S LAW IN SODA-LIME GLASS, by R. J. Maurer. J. Chem. Phys. 9, 579-84 (1941).
248. EFFECT OF PARTIAL DEVITRIFICATION ON ELECTRICAL RESISTIVITY OF SODIUM-BEARING GLASSES, by B. L. Joyner, W. C. Bell. Am. Cer. Soc. J. 36 (8) 263-6 (August, 1953).
249. EFFECT OF TEMPERATURE ON THE ELECTRICAL RESISTANCE AND VOLTAGE DEPARTURES (ERRORS) OF GLASS ELECTRODES, AND UPON THE HYGROSCOPICITY OF GLASS, by D. Hubbard. Bibliog. diag. J. Res. Nat. Bur. Stand. 50: 337-42 (June, 1953).
250. ELECTRICAL RESISTIVITY OF VITREOUS TERNARY LITHIUM-SODIUM SILICATES, by S. W. Strauss. Bibliog. J. Res. Nat. Bur. Stand. 56: 183-5 April, 1956.
251. ELECTRICALLY RESISTANT GLASS, by L. A. Grechanik and L. A. Vakusevich. U.S.S.R. 118, 310 Feb. 20, 1959.
252. ENAMEL COVERED GLASS RESISTORS, by J. K. Davis. II. Tele-Tech 11: 55 Nov., 1952.
253. FINAL REPORT ON HERMETICALLY SEALED HIGH MEGOHM RESISTORS (INCLUDES GLASS - ELECTRICAL PROPERTIES). Sprague Elec. Co., Mass. 1951. 29p. PB 107047.
254. FUNDAMENTAL FACTORS CONTROLLING ELECTRICAL RESISTIVITY IN VITREOUS TERNARY LEAD SILICATES, by S. W. Strauss and others. Bibliog. il. diag. J. Res. Nat. Bur. Stand. 56: 135-42 March, 1956; Abstract. Franklin Inst. J. 262: 479-80 December, 1956.
255. GLASS RESISTOR FOR USE IN VACUUM SYSTEMS, by L. G. Sloan. Diags. il. R. Sci. Instr. 27: 1019-21 December, 1956.

256. GLASSES OF HIGH RESISTIVITY AND LOW DIELECTRIC LOSSES,
by A. Danzin (to Compagnie generale de telegraphie sans fils)
U.S. 2,580,662 Jan. 1, 1952.
257. PHYSICS OF THE GLASSY STATE: II. TRANSFORMATION RANGE,
by E. U. Condon. Am. J. Phys. 22 (3) 132-42.
Electrical resistance, dependence on fictive temperature.
258. K PROBLEME POLUCHENIYA POLUPROVODYOSHCHEI PLANKI V
SVINTSOVO-VISMUT-OVYKH STEKLAKH PRI OBRABOTKE IKH V
VODORODE, by N. I. Ananich, L. A. Grechanik. Zhurnal Prikladnoi
Khimii 31 (4) April, 1958; p. 566-71.
Production of half-conducting film in lead bismuth glasses
by processing in hydrogen; experimental investigation of additions
of Bi_2O_3 and Na_2O on surface resistance of lead-bismuth glasses
subjected to treatment in hydrogen at varying temperatures.
259. RELATION BETWEEN TEMPERATURE AND ELECTRICAL RESIST-
ANCE OF $\text{K}_2\text{O}-\text{SiO}_2$ GLASS, by M. Ida. J. Japan. Ceram. Assoc., 50
(590) 57-60 (1942).
260. TEMPERATURE VARIATION OF THERMAL EXPANSION AND ELEC-
TRICAL RESISTIVITY OF BOROSILICATE GLASS, by S. M. Cos, J. F.
Stirling and P. L. Kirby. Soc. Glass Tech. J. 35 (163) 103-35
(April, 1951).
261. VISCOSITY AND ELECTRICAL RESISTIVITY OF MOLTEN ALKALI
BORATES, by L. Shartsis, et al. Bibliog. diag. Am. Cer. J. 36:
319-26 Oct. 1, 1953.
262. VISCOSITY, DENSITY, AND ELECTRICAL RESISTIVITY OF MOLTEN
ALKALINE - EARTH BORATE GLASSES WITH THREE MOLE PER
CENT OF POTASSIUM OXIDE, by L. W. Coughanour, et al. Bibliog.
Am. Cer. Soc. J. 41: 324-9 Aug. 1, 1958.

Determination

263. CALCUL APPROCHE DE LA RESISTIVITE ELECTRIQUE DES VERRES
SILICATES, by M. A. Danzin. Academie des Sciences - Comptes
Rendus 228 (6) 487-9 (Feb. 7, 1949).
264. CALCULATIONS OF THE ELECTRICAL RESISTIVITY OF SILICATE
GLASSES, by A. Danzin. Compt. Rend. 228, 487-9 (1949).

265. DETERMINATION OF RESISTIVITY OF "LOSSY" MATERIALS FROM DIELECTRIC MEASUREMENTS, MAKING USE OF INTERFACIAL POLARIZATION, by R. J. Lewis and L. R. Bickford, Jr. J. Am. Ceram. Soc., 39 (6) 222-26 (1956).
266. MEASUREMENT OF THE ELECTRIC RESISTIVITY OF GLASSES, by K. Leung. Compt. Rend., 223 (5) 236-37 (1946).
267. A SIMPLE DIRECT-CURRENT METHOD FOR THE DETERMINATION OF THE ELECTRICAL RESISTANCE OF GLASS, by H. E. Taylor (Univ. Sheffield, Engl.) J. Soc. Glass Technol. 29, 193-204T (1955).

AUTHOR INDEX

- Abadie, P., 127
 Akahira, T., 105
 Ananich, N. I., 258
 Anders, H., 153
 Anderson, O. L., 150, 188
 Anderson, W. T., Jr., 167
 Antonova, E. A., 199
 Appen, A. A., 5, 70, 104, 220
 Armistead, W. H., Jr., 36, 37,
 38, 41
 Astin, A. V., 140
 Badger, A. E., 75, 182, 207
 Bandyopakyay, G., 163
 Barzakovskii, V. P., 5, 104, 220
 Baynton, P. L., 209
 Bell, W. C., 248
 Belyaev, I. N., 116
 Bender, M., 236
 Beyersdorfer, H., 224, 225
 Bickford, F. A., 16, 265
 Blodgett, K. B., 169, 244
 Boksay, Z., 200, 201, 202
 Bonan, M., 152, 159
 Bonino, J., 89
 Borgnis, F., 133
 Bowers, R. C., 29
 Bowness, C., 187
 Bresker, R. I., 70
 Brinberg, V. A., 157
 Callinan, T. D., 29
 Chirkov, N., 240
 Colbert, W. H., 177
 Condon, E. U., 257
 Corning Glass Works, 35, 46,
 136, 143
 Cornish, F. L., 232
 Cos, S. M., 260
 Coughanour, L.W., 262
 Coutlee, K. G., 65
 Cusak, N., 187
 Dale, A. E., 120
 Danzin, A., 11, 18, 256, 263, 264
 Datta, S., 163
 Davis, J. K., 252
 Day, R. K., 1
 Demeshina, A. I., 98
 Descarsin, M., 71
 De Silva, R. C., 119, 122
 Dolov, M. A., 129
 Douglas, R. W., 121
 Downie, C. K., 149
 Ellis, R. B., 179
 Evans, H. J., 66
 Evstrop'ev, K. S., 49
 Field, R. F., 65
 Fitzgerald, J. V., 8, 184
 Fowler, R. G., 238
 Fröhlich, H., 61
 Funk, H. H., 246
 Gaman, V. I., 217
 Gaiser, R. A., 168, 170
 Geballe, T. H., 245

- Gemant, A., 203
Gemmant, A., 25
Girard, P., 127
Gladkikh, M. A., 77
Glascow, F. A., 25
Glaser, G., 52
Glass Fibers, Inc., 62
Gleichhauf, P. H., 55
Golikova, E. V., 214
Gomer, R., 181
Grechanik, L. A., 208, 215,
 251, 258
Green, R. L., 123, 169
Guyer, E. M., 26, 130
Halla, F., 229
Halske, --, 23
Hatoyama, M., 172
Hausmann, E. O., 65
Hazen, T., 65
Helden, A. E., 134, 144
Heroux, L., 109
Hirayama, C., 115
Hirose, M., 53
Hofbauer, G., 174
Hoge, H. J., 139
Hogg, P. M., 137, 138
Hood, H. P., 39, 41
Hubbard, D., 249
Hudson, R., 47, 126
Humphrys, J. M., 64
Ida, M., 259
Inada, K., 59
Ioffe, V. A., 9, 84, 96, 104
Isard, J. O., 194
Iwamoto, M., 151
Jenaer Glaswerk Schott, 10
Joyner, B. L., 248
Jung, A. E., 185
Kabardin, U., 129
Kamazawa, M., 105
Kamogawa, H., 53
Kantzer, M., 28, 243
Kashtanova, A. M., 44
Keller, K. J., 54, 58
Kessenikh, R. M., 78
Khar'kov, A. A., 83
Khodakov, A. L., 116
Khvostenko, G. I., 9
Kirby, P. L., 160, 230, 260
Klemperer, H., 15
Kobeko, P. P., 183
Koenig, J. H., 45
Kollath, D. A., 7
Koller, L., 229
Kosman, M. S., 14
Kostanyan, K. A., 190, 191
Kozlovskii, V. K., 48
Kralove, H., 27
Kurokawa, K., 43
Kurtts, L. Y., 234
Kuvshinskii, E. V., 183
Kuznetsov, A. Y., 157, 164, 221,
 222, 237, 239
Lebedev, A. A., 5, 44, 104, 220

- Le Clerc, P., 34, 235
Leko, E. K., 210, 211
Lengyel, B., 189, 195, 200,
201, 202
Lepretre, R., 6
Leung, K., 266
Lev, E. Y., 210, 211
Lewis, R. T., 265
Littleton, J. T., 2
Lucas, R. L., 29
Lyon, D. N., 245
Majumdar, S. K., 163
Markin, B. I., 5, 162, 166, 176,
196, 197, 198
Martyushov, K. I., 77
Maschka, A., 229
Massachusetts Institute of
Technology Laboratories, 50, 51
Maurer, R. J., 56, 216, 247
Mazurin, O. U., 193, 210, 211,
214, 226
Meahl, H. R., 65
Mel'nikova, I. G., 157, 164
Meunier, P., 11, 18, 19
Mitchell, J. W., 141
Monaghan, B., 178
Moore, H., 119, 122
Morey, G. W., 3
Morgan, W. L., 177
Morgan, W. R., 64
Moriya, T., 91, 99, 124, 132
Moses, G. L., 146
Mulchanova, E. V., 193
Munakata, M., 151
Myuller, R. L., 165, 173, 180,
204, 205
Nalchadzhyan, S. O., 190
Naudin, F., 13
Navias, L., 123
Odelevskii, V. I., 81, 82
Oldekop, W., 227
Owen, A. E., 121
Pavlova, G. A., 206, 210, 211
Peck, D. B., 17
Pegg, E. F., 120
Pennsylvania State College, 42, 155
Petrosan, V. P., 90, 97, 113, 117
Phillips, C. J., 142
Pirani, M., 131
Podushko, E. V., 125
Poley, J. P., 114
Pöll, M., 229
Presnov, V. A., 5, 217, 220
Proisl, J., 229
Pryanishnikov, V. P., 5
Rappaport, I., 186
Reynolds, S. I., 7
Richards, P. A., 69
Rinehart, D. W., 72, 88, 89
Robinson, P., 17
Rutter, M. M., 115
Saito, S., 43
Sakuntala, M., 238
Scholes, S. R., 40
Seddon, E., 141

- Shand, E. B., 22
 Shartsis, L., 261
 Shaw, T. M., 68
 Sheludyakov, N. A., 228
 Shelyubskii, V. I., 231, 233
 Shirane, G., 12
 Shishkin, N. I., 183
 Sholokhovich, M. L., 116
 Shtol'tser, N. V., 214
 Siemens, -, 23
 Skanavi, G. I., 44, 98
 Sklarsky, U., 27
 Sloan, L. G., 255
 Smith, R. K., 16
 Smoke, E. J., 45
Societe générale de constructions électriques et mécaniques, 147
 Somog, M., 202
 Sprague Electric Company, 253
 Stanford Research Institute, 241
 Stanworth, J. E., 4, 120
 Stevells, J. M., 74, 79, 80, 85, 92,
 93, 94, 100, 101, 102, 103,
 108, 156
 Stirling, J. F., 260
 Stockdale, G. F., 63
 Strauss, S. W., 250, 254
 Strutt, M. J. O., 73, 86
 Stuart, D. A., 150, 188
 Subbarao, E. C., 12
 Suita, T., 57, 219
 Sutton, P. M., 19
 Taylor, H. E., 106, 107, 110, 111,
 112, 267
 Taylor, N. W., 24
 Thomas, G. C., 55
 Thurnauer, H., 75, 135
 Toropov, N. A., 5, 104, 220
 Tsurumi, I., 161
 Tudomanyos, M., 67
 Tumita, Y., 105
 Turi, L., 67
 Turner, W. E. S., 141
 Tuszyński, W., 158
 Tuttle, E. M., 128
 Urban, F., 178
 Urnes, S., 223
 Vakusevich, L. A., 251
 Val'ter, A. F., 77
 van Amerongen, 108
 van der Ziel, D., 73, 86
 Vargin, V. V., 125, 199
 Verebeichik, N. M., 81, 82
 Vermeer, J., 60, 118, 218
 Voldan, J., 27
 Volger, J., 85, 87, 92, 94, 108
 von Hippel, A., 56
 Vose, W., 32
 Weinrich, A. R., 177
 Weyl, W. A., 20
 White, H. L., 178
 White, J. F., 182, 207
 Wildman, S. G., 186

- Wilson, H. H., 128
Windle, J. J., 68
Yamamoto, J., 212, 213
Yamanaka, I. C., 57, 219
Yashuhara, N., 76
Zhdanov, S. P., 221, 222

ARGONNE NATIONAL LAB WEST



3 4444 00011898 4